Project Management Planning

Resource Planning

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Overview of Resource Planning

Every organization has a limited number of resources to perform tasks. A project manager's primary role is to find a way to successfully execute a project within these resource constraints. Resource planning is comprised of establishing a team that possesses the skills required to perform the work, as well as scheduling the non-labor resources (tools, equipment, and processes) that enable the staff to complete the project.

Determining the Size of the Team

The optimal size of a project team is driven by two principal factors. One is the total number of tasks to be performed, and the other is the effort needed to perform the tasks.

In developing the schedule and assigning the resources, the project manager determines the optimal mix of staff to activities. Doubling resources does not necessarily double productivity. For example, 365 engineers could not complete in a day a project estimated at one person per year. At some point, people begin to get in each other's way. The significance of the project duration, as well as each major activity's duration, need to be clearly understood and documented as part of the scheduling process.

Adding more people to an activity creates the need for additional communication and may also increase the need for equipment or tools. Large teams require a significant amount of coordination and teamwork. Sometimes a smaller team can accomplish much more than a larger one in a shorter period of time. The optimal selection also depends on the personalities of the team members and the communication and organizational skills of the project manager.

Adequate and timely personnel planning contains cost overruns. Having personnel on-board when they are not essential is extremely costly. It is important for the project manager to understand the size of the required team needed to perform the weekly scheduled work. For this reason, significant effort needs to be made in the planning phase to identify the resources required to complete each task.

Determining Required Skills

Finding available staff with the skills required to perform a task is critical to project success. For example, some assumptions about the skills of the person performing the task are made by the project manager. The skills of the people performing the work is directly related to the time it takes to perform a task.

It is helpful in the planning process to develop a list of skills required, first for execution of the project, and then for execution of each task. This skills list may then be used to determine the type of personnel required for the task.

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The project manager pragmatically assess the skills of the available people on the project. The project manager's job is to determine the risks associated with the available skills and to build a plan that realistically accounts for those skills. Unfortunately, skill level is not a yes/no factor. People have varying degrees of skill, and the manager needs to determine the level of schedule adjustment that should be made based upon the staff skill level.

Where staff with the necessary skills are largely unavailable for assignment on the project, the project manager has an option to hire the necessary talent or contract services to perform the work.

Identifying Required Non-Labor Assets

All project teams require the tools necessary to successfully perform the tasks assigned. In scheduling resources, the project manager must ensure that both people and necessary equipment to support those people are available simultaneously.

The need for adequate work space is often overlooked when planning a project. If a 15-person project team is going to start work, there needs to be a facility to house the staff. Ideally, the team should be placed in contiguous space to facilitate interaction and communication. By having everyone working in close proximity, team spirit is enhanced and chances for project success are increased. While this may not always be feasible, it is a goal worth striving for.

In addition to workspace, equipment for the team should be included in the plan. Assuring the availability of equipment at critical points in the project is key in planning a successful project. Efficiency and morale are negatively affected by non-availability of equipment needed to perform a task.

Define Resource Profiles

A staffing plan is developed for each project. The staffing plan may be as simple as identifying one person to develop a simple database. For more significant projects, the staffing plan identifies when and how staff is brought onto and taken off the project team. For small projects, this may be simply stated as the assignment of three people full time to the project throughout its six month duration.
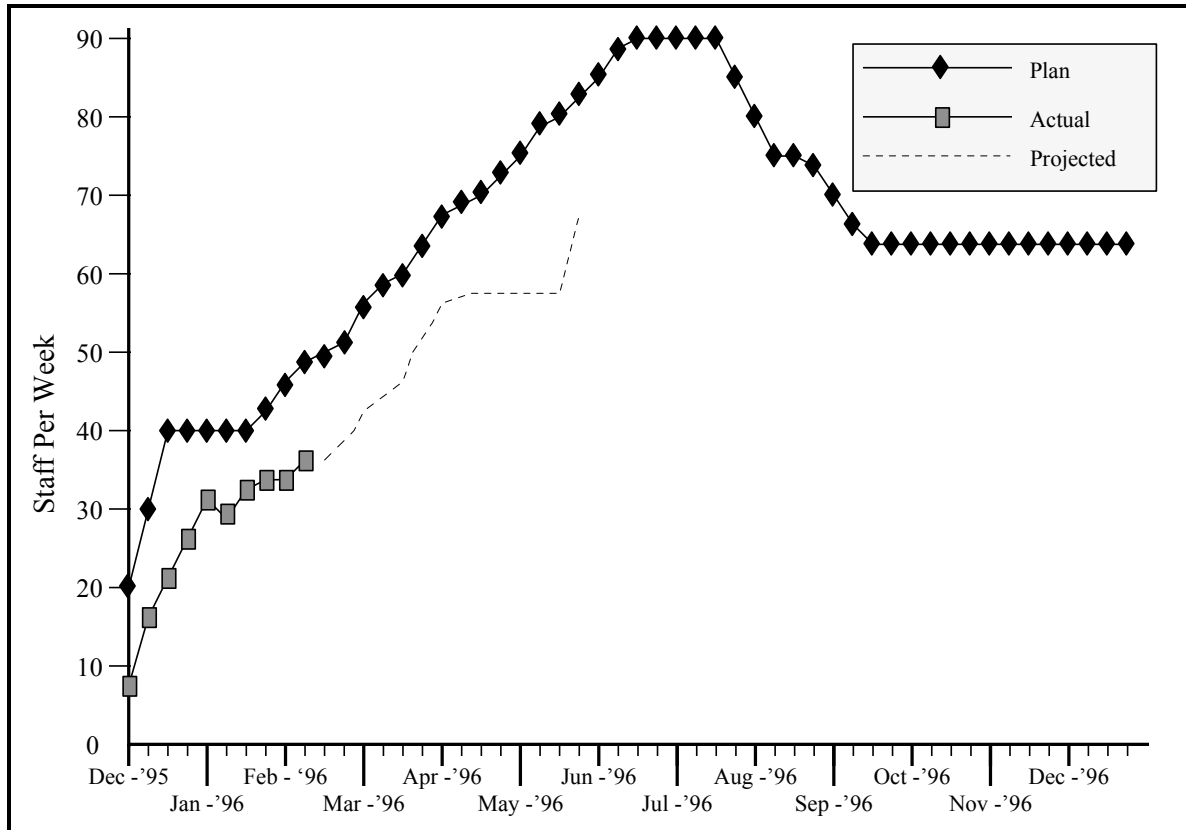
For large projects, the problem is much more complex, and the creation of a detailed plan is a requirement. The following shows the type of graph that is useful in the Project Plan for large projects.

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Example Staffing Plan

The figure above shows the planned number of people required by week for a project team. The graph also depicts how actuals might be applied in the performance of the project.

The graphic representation of the staffing plan helps to point out peaks and valleys in staffing that can present serious project management problems. The project manager realistically determines how a relatively consistent staffing level can be maintained. Particular attention is paid to releasing resources when they are no longer needed on the project. It is unrealistic to assume that the project can go from a 5-person to 10-person level of effort in a month and then return to a 5-person effort in another month. Resource leveling is supported by many project scheduling tools, but requires the special attention of the project manager in both the planning and the execution phases of the project.

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Forming the Team

Project organization is used to coordinate the activity of the team and to define the roles and responsibilities of team members. Project organization is needed for every IT project, and a project manager must always be identified.

Confusion and lack of productivity are the result of poor project organization. This is where many projects run into trouble. A good organization facilitates communication and clearly defines roles and responsibilities.

There are numerous ways to organize a project, and many projects require a unique organizational structure. There are no standard organizational methodologies that every project should use. A sample organization chart for a large project is shown below, with the types of functions that are often assigned to a project.

Sample Organizational Chart
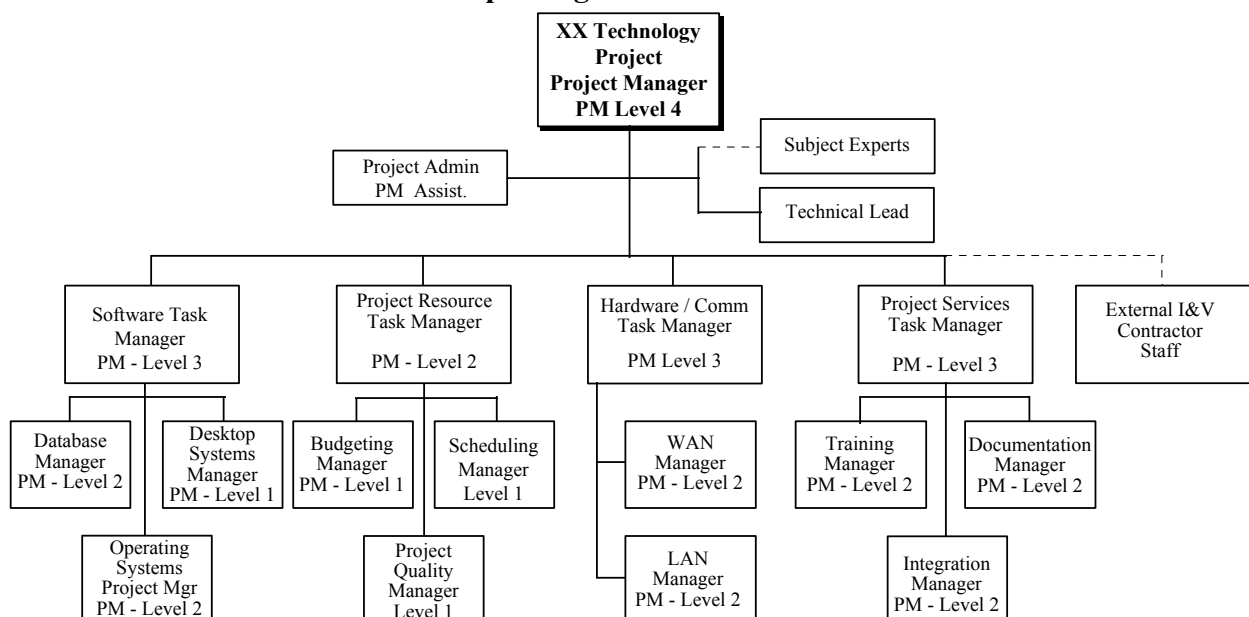
The larger the project, the more critical the organizational structure becomes. In a small project, a single team member may be responsible for several functions, whereas in a large project the functions might require full-time attention. A very large project, for instance often requires a deputy project manager. A small project might have the senior technical staff member serving as a development manager. Definition of the project organization is a critical part of the planning process.

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Project complexity also is a major factor when organizing a project. For example, a project that includes a large software development component typically includes a software development manager. This allows for a concentration of resources on a high risk area.

Unless a project is extremely small (about 5 people), it is useful to organize the project into functional teams. This approach leads to idea synergy and improved communications. The project manager is responsible for defining and selecting the team leaders. Team leaders can off-load some of the work of the project manager and take responsibility for completion of tasks. Team composition should be determined early in the planning phase, so that leaders are involved in the planning and also assist in defining a successful project plan.

Define Assumptions

Documenting the assumptions made in resource allocation is critical to the later success of the project. Without clear documentation of these assumptions, later changes in the staffing are very difficult and risky.

If, for example, a key person with a specialized technical skill was assumed in the plan, that assumption must be documented. Then, if that resource is unavailable to perform the task, the project manager can recognize the risk and make necessary decisions. Without documentation of the assumption, the plan is open to serious risk without the project manager realizing it.

Identify Risks

Risks are inherently involved with scheduling resources. Sound resource planning makes allowances for dealing with risks in one or more of the following ways:

- Where significant resource risks are identified, add an additional WBS task for risk management/risk reduction, and financial reserves can be set aside to deal with potentially delayed schedules.

- Add time to those tasks where resources are known to be a problem. There is no rule of thumb for this multiplier; it depends on the degree of risk and the overall impact that resource problems can have on the project.

- Add a percentage time multiplier to the schedule for specific individuals, particularly if new technology is being used or if the person providing the estimate is extremely optimistic. Remember that technical staff typically underestimate the time required to do any particular task.

- Where skill shortage is identified, add time and resources for training. By recognizing resource shortfalls and providing the necessary training, a project manager mitigates some level of risk.

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Forms:

The resource loading profile (Example Staffing Plan) and a sample organization chart are included in Appendix B: *Templates & Sample Forms*.